

REMARKS

This AMENDMENT UNDER 37 CFR 1.111 is filed in reply to the outstanding Office Action of May 21, 2004, and is believed to be fully responsive thereto for reasons set forth below in greater detail.

Initially, the Examiner is thanked for the indication of allowable subject matter in paragraphs 5 and 6 of the Office Action.

Responsive to paragraph 1 of the Office Action, the title has been amended as suggested kindly by the Examiner.

Responsive to paragraphs 2-6 of the Office Action, the claims have been extensively reviewed and amended to ensure that proper antecedent basis exists for all recitations therein.

“Collar oxide regions”, “sidewalls” “sacrificial oxide layer” and “nitride liner layer” are now used consistently in the claims. The location of the deep trenches in claim 1, paragraph (a) is now believed to be clearer than the previous deleted description.

In claims 3 and 4, the meaning of “is selective to” has been clarified by using the more functional recitation “stops at and does not etch.”

Moreover, claims 1, 2, 6, 7, 8, 9 and 10 have been amended to ensure the recitations are to plural, not singular, recited elements, as appropriate, and only to use singular recitations when the singular recitations are clear and proper.

Responsive to paragraphs 2-4 of the Office Action, claims 1-8 have been revised as appropriate with the Examiner’s objections in mind, and with the following explanations.

Claim 1, paragraph (e), “collar oxide regions” are now recited for proper

antecedent basis.

Regarding the objection to claim 8, line 1, it is noted that claim 1, line 6, provides proper antecedent basis for “said recessed deep trench conductors.”

Regarding the objection to claim 6, that step is described and fully supported in the specification at page 2, lines 25-27.

Reconsideration is respectfully requested of the rejection of claims 2 and 4 under 35 USC 112, in paragraph 3 of the Office Action, as specifying subject matter not sufficiently described in the specification.

It should be realized that the present invention discloses and teaches generally the “deposition of a thin nitride liner just before TTO (trench top oxide) HDP (high density plasma) deposition that functions to protect the collar oxide enclosed by the liner from being etched during the TTO oxide sidewall etch and provides additional lateral etch protection which is not realized in current processing schemes.” page 10, line 30 to page 11, line 2

Moreover, the present invention discloses and teaches two separate embodiments.

A first embodiment is illustrated in Figure 4 wherein the TTO nitride liner 28 is deposited, without first forming a sacrificial gate oxide layer, as illustrated by Figure 4. “Figure 4 is a detailed illustration of the resulting structure after the TTO sidewall nitride etch is performed and assuming no sacrificial oxide had been previously deposited.” page 8, lines 13-14.

A second embodiment is illustrated in Figure 3 wherein a sacrificial gate oxide layer is first formed beneath and before the deposition of the TTO nitride liner. Claims 2 and 4 are directed to the second embodiment illustrated in Figure 3. “Figure 3 is a detailed illustration of the resulting channel structure when optional sacrificial oxide layer 60 is formed prior to

nitride liner deposition 50.” page 8, lines 10-11

The second embodiment of Figure 3 is described in the specification as follows.

“As discussed in greater detail herein with respect to Figure 3, an optional step is provided whereby a sacrificial gate oxide layer is first grown prior to depositing the TTO nitride liner 28.” page 9, lines 1-3

“In the next processing step as depicted in Figure 2(d), the portion 51 of the TTO nitride liner which is now not covered by the TTO HDP oxide 28 is removed. This nitride etch need only be selective to oxide in the case where a sacrificial oxide layer is used under the liner.” page 9, lines 20-23

The subject matter of claim 2 is drawn generally to, and is fully supported by, the second embodiment as described above. Moreover, the paragraph starting at page 9, line 6, has been amended to provide clearer support for the subject matter of claim 2.

The subject matter of claim 4 is fully supported by the description of Figure 3 in the sentence at page 9, lines 21-23, and the illustration of Figure 3. However, to further clarify this point, the description of Figure 3 at page 9, line 9, has been amended to further explain the subject matter of claim 2 with respect to the illustration of Figure 3. Moreover, claim 2 has been amended slightly to more clearly recite the claimed subject matter.

This application is now believed to be in condition for allowance, and a Notice of Allowance is respectfully requested. If the Examiner believes a telephone conference might

expedite prosecution of this case, it is respectfully requested that he call applicant's attorney at
(516) 742-4343.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "William C. Roch". The signature is fluid and cursive, with the first name "William" being more prominent.

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